

Soakage Letter Report

CLIENT	Berry Farming Ltd c/o John Hall Consulting
SITE ADDRESS	Lower Farm, Walberton, Arundel, BN18 0AS
REPORT	GWPR4084
REFERENCE	The terms and conditions of this report are shown within Appendix A.
ENGINEER	Natasha Kearn, Ground and Water Limited
GENERAL	Ground and Water Ltd were instructed by John Hall Consulting on the 26 th January 2021 to conduct Soakaway Testing for a site known as Lower Farm, Walberton, Arundel, BN18 0AS. The scope of the investigation was detailed within the Ground and Water Limited fee proposal ref. GWQ6040 dated the 25 th November 2020.

SCOPE OF WORKS	Site works were undertaken on the 4 th February 2021 and comprised the machine excavation of 3No. Trial Pits, referenced (TP1 – TP3) to a depth of 0.80m bgl. A trial hole location plan can be seen in Figure 1 and the trial hole logs can be seen in Appendix B.
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PROPOSED DEVELOPMENT	At the time of reporting, February 2021, the proposed development was understood to comprise the construction of a large glass house within the north of the site and a reservoir within the south of the site.
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GROUND CONDITIONS ENCOUNTERED	Summary of Strata Encountered (TP1 – TP3)			
	Strata	Depth Encountered (m bgl)	Final Depth (m bgl)	Thickness (m)
	TOPSOIL (ALL TRIAL HOLES): Generally comprised a brown slightly sandy to sandy silty CLAY. The sand was fine to medium.	GL	0.10 – 0.15	0.10 – 0.15
	UNDIFFERENTIATED RIVER TERRACE DEPOSITS (ALL TRIAL HOLES): Generally comprised an orangish-brown sandy CLAY. The sand was fine to coarse.	0.10 - 0.15	0.80	0.65 - 0.70

GROUNDWATER	It should be noted that soakaway tests were undertaken during a time when there was significant standing water on the surface and during a period of heavy rain. It is therefore possible that water from the surface may enter the pits and lead to erroneous results. A tabulated summary of the depth of standing water and water seepage noted can be viewed below.
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Depth of Standing Water and Water Seepage within Trial Holes	
Trial Hole	Standing Water level at time of filling pits (m bgl)
TP1	0.70
TP2	0.70
TP3	0.65

ROOTS	A tabulated summary of the depth of root penetration can be viewed below.
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Depth of Root Penetrated Soils Observed Within Trial Holes		
Trial Hole	Fresh Roots (m bgl)/ fresh rootlets	Decayed roots (m bgl)
TP1	0.30	None
TP2	0.30	None
TP3	0.40	None

INFILTRATION TESTS

Soakage testing, in accordance with the principles of BRE365, were attempted within TP1 – TP3 at 0.80m bgl. Due to presence of standing water at the base of the trial pits in TP2 and TP3 and the heavy rainfall, the water levels minimally fluctuated throughout the day. TP1 – TP3 were bottomed out within the cohesive soils of the Undifferentiated River Terrace Deposits.

The starting depths and end depths recorded are tabulated below.

BRE 365 Soakage Test Results - Recorded Infiltration Rates m/s			
Trial Hole	Starting Depth (m bgl)	End Depth (m bgl)	Time taken (minutes)
TP1	0.240	0.365	305
TP2	0.180	0.185	345
TP3	0.165	0.170	350

No infiltration rate could be calculated due to the water level rising within the trial pits of TP2 and TP3. However, it was possible to calculate an infiltration rate for TP1.

BRE 365 Soakage Test Results - Recorded Infiltration Rates m/s			
Trial Hole	Test 1	Test 2	Test 3
TP1	1.685×10^{-6}	-	-

* Due to the slow infiltration rates within the soils, TP1 could not be completed with the 3 fillings required for BRE365 compliance. It should also be noted that to comply with BRE365 the water must drain within 24 hours which was not possible within these soils.

A review of the Environment Agency website revealed the site was underlain by a **Secondary A Aquifer** associated with the superficial deposits of the Undifferentiated River Terrace Deposits, overlying a **Unproductive Strata**, comprising the bedrock deposits of the London Clay Formation.

Superficial (Drift) deposits are permeable unconsolidated (loose) deposits, for example, sands and gravels. The bedrock is described as solid permeable formations e.g. sandstone, chalk and limestone.

Secondary aquifers include a wide range of drift deposits with an equally wide range of water permeability and storage capacities.

Secondary Aquifers include a wide range of rock layers or drift deposits with an equally wide range of water permeability and storage. **Secondary A Aquifers** comprise permeable layers capable of supporting water supplies at a local rather than strategic scale, in some cases forming an important source of base flow to rivers. These are generally aquifers that were formerly classified as Minor Aquifers by the Environment Agency.

Unproductive Strata are rock layers with low permeability that have negligible significance for water supply or river base flow. These were formerly classified as non-aquifers.

Examination of the Defra records showed that the site did not fall within a Groundwater Source Protection Zone as classified in the Policy and Practice for the Protection of Groundwater.

Consultation with the Environment Agency must be sought regarding any use that may have an impact on groundwater resources.

It was understood that all of the run off from the Glass House will be filtered via pipes to the reservoir.

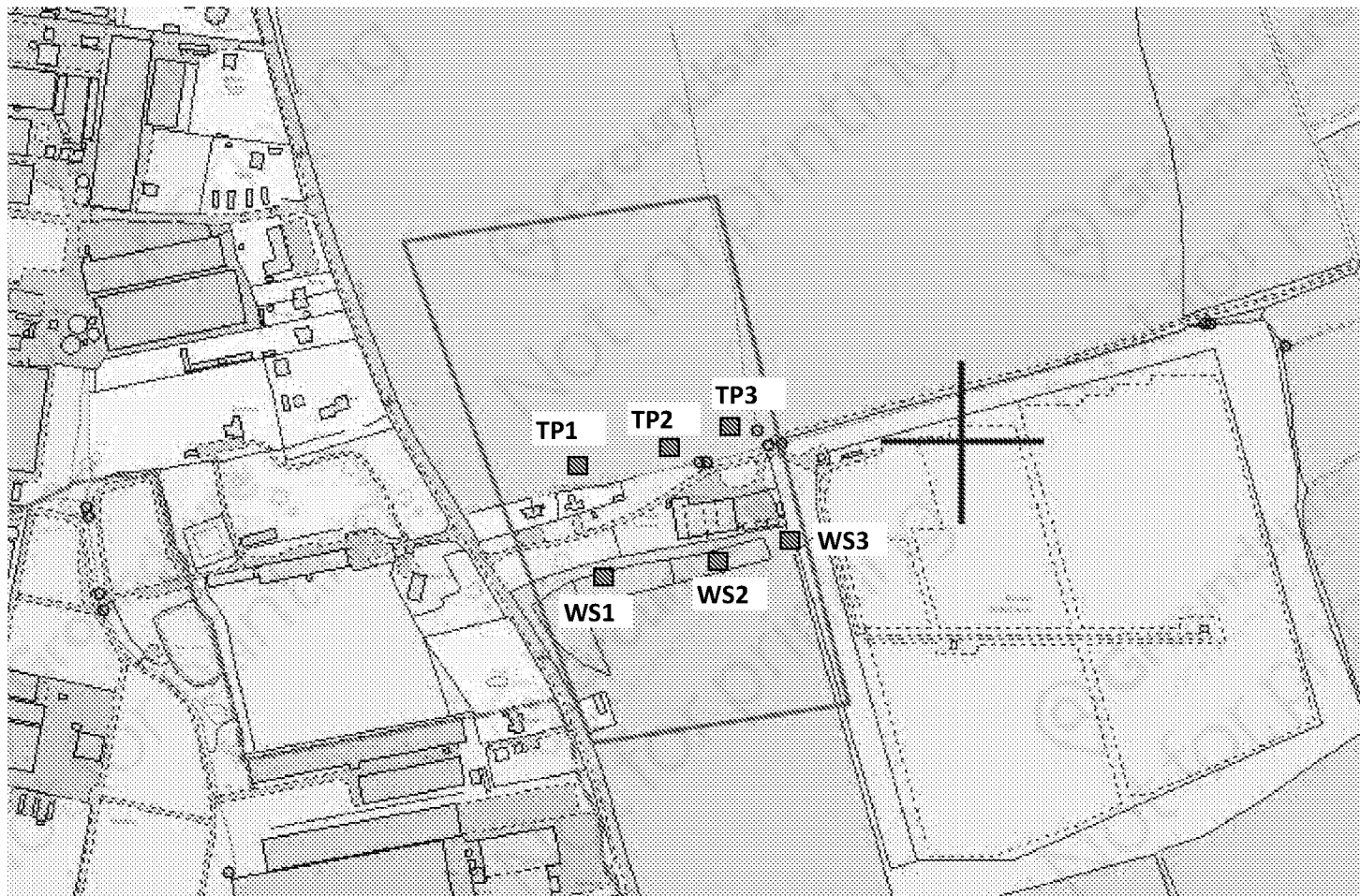
Please feel free to contact us should you have any queries regarding the information enclosed within this letter report.

Yours sincerely,



Natasha Kearl BSc (Hons);
Geotechnical and Geo-environmental Engineer
For and on behalf of Ground and Water Limited

Figure 1	Trial Hole Location Plan
Appendix A	Terms and Conditions
Appendix B	Trial Hole Logs



Not To Scale

Project:

Lower Farm, Walberton, Arundel BN18 0AS

Figure 1

Berry Farming Ltd c/o John Hall Consulting

Date:

February 2021

Trial Hole Location Plan

Ref:

GWPR4084



APPENDIX A

Conditions and Limitations

The ground is a product of continuing natural and artificial processes. As a result, the ground will exhibit a variety of characteristics that vary from place to place across a site, and also with time. Whilst a ground investigation will mitigate to a greater or lesser degree against the resulting risk from variation, the risks cannot be eliminated.

The report has been prepared on the basis of information, data and materials which were available at the time of writing. Accordingly, any conclusions, opinions or judgements made in the report should not be regarded as definitive or relied upon to the exclusion of other information, opinions and judgements.

The investigation, interpretations, and recommendations given in this report were prepared for the sole benefit of the client in accordance with their brief; as such these do not necessarily address all aspects of ground behaviour at the site. No liability is accepted for any reliance placed on it by others unless specifically agreed in writing.

Any decisions made by you, or by any organisation, agency or person who has read, received or been provided with information contained in the report ("you" or "the Recipient") are decisions of the Recipient and we will not make, or be deemed to make, any decisions on behalf of any Recipient. We will not be liable for the consequences of any such decisions.

Current regulations and good practice were used in the preparation of this report. An appropriately qualified person must review the recommendations given in this report at the time of preparation of the scheme design to ensure that any recommendations given remain valid in light of changes in regulation and practice, or additional information obtained regarding the site.

Any Recipient must take into account any other factors apart from the Report of which they and their experts and advisers are or should be aware. The information, data, conclusions, opinions and judgements set out in the report may relate to certain contexts and may not be suitable in other contexts. It is your responsibility to ensure that you do not use the information we provide in the wrong context.

This report is based on readily available geological records, the recorded physical investigation, the strata observed in the works, together with the results of completed site and laboratory tests. Whilst skill and care has been taken to interpret these conditions likely between or below investigation points, the possibility of other characteristics not revealed cannot be discounted, for which no liability can be accepted. The impact of our assessment on other aspects of the development required evaluation by other involved parties.

The opinions expressed cannot be absolute due to the limitations of time and resources within the context of the agreed brief and the possibility of unrecorded previous in ground activities. The ground conditions have been sampled or monitored in recorded locations and tests for some of the more common chemicals generally expected. Other concentrations of types of chemicals may exist. It was not part of the scope of this report to comment on environment/contaminated land considerations.

The conclusions and recommendations relate to Lower Farm, Walberton, Arundel, BN18 0AS.

Trial hole is a generic term used to describe a method of direct investigation. The term trial pit, borehole or window sampler borehole implies the specific technique used to produce a trial hole.

The depth to roots and/or of desiccation may vary from that found during the investigation. The client is responsible for establishing the depth to roots and/or of desiccation on a plot-by-plot basis prior to the construction of foundations. Where trees are mentioned in the text this means existing trees, recently removed trees (approximately 15 years to full recovery on cohesive soils) and those planned as part of the site landscaping.

Ownership of copyright of all printed material including reports, laboratory test results, trial pit and borehole log sheets, including drillers log sheets, remain with Ground and Water Limited. Licence is for the sole use of the client and may not be assigned, transferred or given to a third party.

Only our client may rely on this report and should this report or any information contained in it be provided to any third party we accept no responsibility to the third party for the contents of this report save to the extent expressly outlined by us in writing in a reliance letter addressed from us to the third party.

Recipients are not permitted to publish this report outside of their organisation without our express written consent.

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APPENDIX B

Trial Hole Logs



Trial Pit Log

Project Name: Lower Farm, Walberton, Arundel BN18 0AS		Client: Berry Farming Ltd c/o John Hall Consulting		Date: 04/02/2021	
Location: Lower Farm, Walberton, Arundel BN18 0AS		Contractor:			
Project No. : GWPR4084		Crew Name:		Equipment:	
Location Number TP1	Location Type TP	Level	Logged By	Scale 1:25	Page Number Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.15			TOPSOIL: Brown sandy silty CLAY. The sand was fine to medium.	
		0.30	D					Orangish-brown sandy CLAY. The sand was fine to coarse (UNDIFFERENTIATED RIVER TERRACE DEPOSITS).	
		0.50	D						
		0.80	D		0.80			End of Borehole at 0.800m	
									1
									2
									3
									4
									5

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks

Remarks Roots noted to 0.30m bgl. Water ingress at the base of the trial pit was noted to rise to 0.70m bgl.	
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Trial Pit Log

Project Name: Lower Farm, Walberton, Arundel BN18 0AS		Client: Berry Farming Ltd c/o John Hall Consulting		Date: 04/02/2021	
Location: Lower Farm, Walberton, Arundel BN18 0AS		Contractor:			
Project No. : GWPR4084		Crew Name:		Equipment:	
Location Number TP2	Location Type TP	Level	Logged By	Scale 1:25	Page Number Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.10			TOPSOIL: Brown slightly sandy silty CLAY. The sand was fine to medium.	
		0.30	D					Orangish-brown and brown sandy CLAY. The sand was fine to coarse (UNDIFFERENTIATED RIVER TERRACE DEPOSITS).	
		0.50	D						
		0.80	D		0.80				
								End of Borehole at 0.800m	1
									2
									3
									4
									5

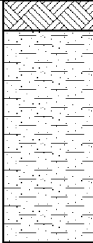
Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks

Remarks Roots noted to 0.30m bgl. Water ingress at the base of the trial pit was noted to rise to 0.70m bgl.	
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Trial Pit Log

Project Name: Lower Farm, Walberton, Arundel BN18 0AS		Client: Berry Farming Ltd c/o John Hall Consulting		Date: 04/02/2021	
Location: Lower Farm, Walberton, Arundel BN18 0AS		Contractor:			
Project No. : GWPR4084		Crew Name:		Equipment:	
Location Number TP3	Location Type TP	Level	Logged By	Scale 1:25	Page Number Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.10			TOPSOIL: Dark brown slightly sandy silty CLAY. The sand was fine to medium. Orangish-brown sandy CLAY. The sand was fine to coarse (UNDIFFERENTIATED RIVER TERRACE DEPOSITS).	
		0.30	D						
		0.50	D						
		0.80	D		0.80				
								End of Borehole at 0.800m	

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks

Remarks Roots noted to 0.40m bgl. Water ingress at the base of the trial pit was noted to rise to 0.65m bgl.	
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